

We claim:

1. A digital signal recording apparatus for recording a digital compressed picture signal by using a rotary magnetic head in contact with running magnetic tape ~~(108)~~, comprising:

picture data extraction circuit ~~(103)~~ for extracting picture data out of input a digital compressed picture signal;

trick-play-data generation means ~~(105)~~ for generating trick-play data from said picture data through program processing;

data disposition circuit ~~(106)~~ for disposing said trick-play data on tracks in predetermined position ~~(104)~~ falling in line with the trace of said rotary magnetic head scanning in trick-play mode; and

storage unit ~~(104)~~ for storing picture data extracted by said picture data extraction circuit and trick-play data that is disposed by said data disposition circuit.

2. The digital signal recording apparatus according to claim 1, wherein said picture data extraction circuit ~~(103)~~ extracts intra-frame coded pictures.

3. The digital signal recording apparatus according to claim 1, wherein said picture data extraction circuit ~~(103)~~ includes start code detection circuit ~~(505)~~ to detect a predetermined picture start code contained in said digital compressed picture signal and end code detection circuit ~~(504)~~ to detect a predetermined picture end code contained in said digital compressed picture signal.

4. The digital signal recording apparatus according to claim 1, wherein said picture data is analyzed into spatial frequency components through the use of discrete cosine transform and said trick-play-data generation means ~~(105)~~ cuts high-band spatial frequency components from said picture data when generating said trick-play data.

5. The digital signal recording apparatus according to claim 1, wherein said storage unit ~~(1702)~~ includes a plurality of picture data storage areas for storing said picture data and allows said trick-play-data generation means ~~(105)~~ to write picture data extracted by said picture data extraction circuit into a first picture data storage area and, at the same time, read stored picture data out of a second picture data storage area in order to generate said trick-play data.

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6. The digital signal recording apparatus according to claim 5, wherein said storage unit ~~(104)~~ includes a plurality of trick-play-data storage areas for storing said trick-play data and allows said trick-play-data generation means ~~(105)~~ to generate and write said trick-play data into a first trick-play-data storage area while reading said trick-play data, which has once been stored, out of a second trick-play-data storage area in order to send it to said data disposition circuit.

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7. The digital signal recording apparatus according to claim 1, wherein said data disposition circuit ~~(106)~~ disposes trick-play data for being reproduced at a plurality of trick-play speeds in place on said magnetic tape.

8. The digital signal recording apparatus according to claim 7, wherein:

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said trick-play-data generation means ~~(105)~~ generates first trick-play data for being reproduced at first trick-play speed at which a recording data rate is the maximum among a plurality of trick-play speeds; and

said data disposition circuit (106) disposes said first trick-play data on the magnetic tape in recording areas falling in line with the trace at said first trick-play speed and reuses and re-disposes said first trick-play data

on the magnetic tape in recording areas falling in line with the trace at second trick-play speed at which the recording data rate is lower.

9. The digital signal recording apparatus according to claim 8, wherein said storage unit ~~(104, 1702)~~ includes at least three trick-play-data storage areas for storing said first trick-play data.

10. A digital signal recording apparatus for recording a digital compressed picture signal by using a rotary magnetic head in contact with running magnetic tape, comprising:

picture data extraction circuit ~~(103)~~ for extracting picture data out of digital compressed picture signal that are input;

trick-play-data generation means ~~(105)~~ for generating trick-play data from said picture data;

data disposition circuit ~~(106)~~ for disposing said trick-play data on tracks in position falling in line with the trace of said rotary magnetic head scanning in trick-play mode; and

storage unit ~~(104)~~ for storing the picture data extracted by said picture data extraction circuit and the

trick-play data that is disposed by said data disposition circuit; wherein

9 said data disposition circuit (~~106~~) disposes data for fast forward trick-play on tracks in predetermined fast-forward data recording locations falling in line with the trace of said rotary magnetic head scanning in fast forward mode and data for rewind trick-play on tracks in predetermined rewind data recording locations falling in line with the trace of said rotary magnetic head scanning in rewind mode.

11. The digital signal recording apparatus according to claim 10, wherein said trick-play-data generation means ~~(105)~~ generates said trick-play data in accordance with the program processing of a microprocessor.

12. The digital signal recording apparatus according to claim 10, wherein said trick-play-data generation means ~~(105)~~ adds error correction code to said trick-play data.

9 13. The digital signal recording apparatus according to claim 10, wherein, if said trick-play data generated by said trick-play-data generation means ~~(105)~~ does not meet in size an integer multiple of the quantity of data to which said error correction code is added, the remaining data

blocks are filled with data that is not decoded into picture data.

9 14. The digital signal recording apparatus according to claim 10, wherein said data disposition circuit ~~(106)~~ disposes said data for rewind trick-play by rearranging the blocks of the trick-play data to constitute a complete picture on screen in sequence of reproducing data at rewinding reproduction.

15. The digital signal recording apparatus according to claim 10, wherein said trick-play-data generation means ~~(105)~~ generates said data for fast forward trick-play and said data for rewind trick-play on the basis of same picture information and different time information.

9 16. The digital signal recording apparatus according to claim 15, wherein time information for said data for fast forward trick-play is replaced with time information for said data for rewind trick-play in said storage unit after said trick-play-data generation means ~~(105)~~ reads the former time information from said storage unit and sends it to said data disposition circuit and before sending the latter time information to said disposition circuit.

17. A recording medium ~~(401)~~ on which a digital signal recording apparatus having a rotary magnetic head records a digital compressed picture signal, wherein data for fast forward trick-play is disposed and recorded thereon in a predetermined fast-forward data recording location falling in line with the trace of said rotary magnetic head scanning in fast forward mode and data for rewind trick-play is disposed and recorded thereon in a predetermined rewind data recording location falling in line with the trace of said rotary magnetic head scanning in rewind mode.

18. The recording medium according to claim 17, wherein error correction code is added to said data for trick-play when data is recorded thereon.

19. The recording medium according to claim 18, wherein, if said data for trick-play does not meet in size an integer multiple of the quantity of data to which said error correction code is added, the remaining data blocks are filled with data that is not decoded into picture data.

20. The recording medium according to claim 17, wherein said data for rewind trick-play is disposed thereon with the blocks of trick-play data to constitute a complete

picture on screen being rearranged in sequence of reproducing data at rewinding reproduction.

21. The recording medium according to claim 17, wherein said data for fast forward trick-play and said data for rewind trick-play generated on the basis of same picture information and different time information are recorded thereon.